

New Jersey Department of Transportation
Bureau of Research
RESEARCH PROJECT
Request for Proposals
2012 Program

Date of RFP
11/2/2011

Closing Date
12/15/2011

Real Time Probe Data Tied to Contractor Performance Measurement
Project No. 2012-06

(Proposals must be prepared in accordance with NJDOT's *Information and Instructions for Preparing Proposals*. Please visit:

<http://www.state.nj.us/transportation/refdata/research/pdf/techpropresproj.pdf>

Revised Proposal Evaluation Forms are available for your information on the website.)

Proposals will be based on the merit of the information contained in the proposal. Budgets will be evaluated separately. Please place three (3) copies of the budget for this project in a separate sealed envelope.

1. RESEARCH PROBLEM STATEMENT, BACKGROUND AND OBJECTIVES

Probe vehicle technologies are in widespread use throughout the United States for a variety of purposes: real-time traffic monitoring, incident management, traveler information, and performance measurements. Probe vehicle systems have the ability to continuously collect large amounts of data with minimal human resource requirements.

The objective of this project would be to determine the feasibility of identifying and applying a performance measure that can be useful in summarizing contractor performance on the potential traffic-delays in a construction work zone based on real time data. The algorithm will take into account the fluctuations in traffic demand using probe data to model user costs for delays in temporary work zones.

A secondary objective would be to determine whether there would be a level of flexibility for the contractor to allow for set up and clearance of a temporary work zone (TWZ) as opposed to the strict cut-off times currently in place. Additionally, the user cost model developed will serve as a Decision Making Tool towards any penalization of the contractor towards clearing of the TWZ.

An acceptable contractor performance measurement could then be defined to better understand the deviation from scheduled clearing time that the contractor has to clear the temporary work zone (TWZ) by. In addition, safety measures should also be included in the development of this performance measure.

A cost benefit analysis should be incorporated into this performance measurement system. Anticipated benefits would quantifiably be measured by including the motoring public cost savings, in terms of deviation from the scheduled to the actual clearing of the work zone site by the contractor. Costs calculated by the travel delays of the motoring public, would be calculated and inputted into a stochastic model wherein the amount of contractor penalties can be proportional with the user cost impact.

This project is categorized as a Congestion Mitigation/Mobility Investment Strategy because by developing a performance measurement computer model for contractors using temporary work zones (TWZ) for roadway construction projects, there would be a quantifiable accountability of contractors with penalization subject to actual disruption of traffic flow.

1. TASKS

[Provide a listing of appropriate general tasks divided into phases based on types of work (e.g., laboratory, field) or by year (e.g., year 1, year 2) or other appropriate milestones]

The NJDOT is seeking the insight of proposal responders on how best to achieve the research objectives. Proposers are expected to describe a research effort that can realistically be accomplished as expeditiously as possible. Proposals must present the proposers' current thinking in sufficient detail to demonstrate their understanding of the problem and the soundness of their approach for conducting the required research.

PHASE I – Literature Search

Conduct a literature search of the current state of the practice.

After the award of the project, a more comprehensive literature search should be conducted. At the completion of this literature search, the Principal Investigator (PI) will make a presentation to the Research Project Selection and Implementation Panel to discuss their findings and to discuss the appropriate research approach.

PHASE II – Research Approach and Anticipated Results

Clear description of how you will solve the problem and implement anticipated findings. Work may be divided into phases (e.g., Laboratory, Field or Year 1, Year 2) as necessary to clarify tasks. *Exit Criteria* must be developed during this phase.

2. IMPLEMENTATION AND TRAINING PLAN

The Principal Investigator (PI) must meet with the Research Project Selection and Implementation Panel (RPSIP) and other NJDOT units to present the findings and as appropriate train these personnel in the use the project results. The Principal Investigator (PI) will develop an implementation plan as per the guidelines provided by NJDOT Research Bureau.

3. DELIVERABLES:

The primary deliverable will be a software model that will develop performance measurements with regard to travel delays caused by roadway construction contractors who set up, maintain and take down temporary work zones (TWZ). This stochastic model would calculate the contractor penalties that would be proportional with the user cost impacts by deviating from designated TWZ schedules.

This model would preferably utilize Microsoft Excel and/or Access, be provided on 10 DVD disks/flash drive/Seagate and would be the intellectual property of NJDOT to operate, maintain and upgrade internally. Model training of NJDOT staff, installation on NJDOT computers, and written instructions on training, installation and upgrading the model would also be included.

The model would include, but not be limited to:

- Determine the level of flexibility for roadway construction contractors to setting up, maintaining and clearing TWZs,
- Measurements, using a cost benefit analysis, of the cost efficiency of utilizing this probe vehicle technology in calculating penalties proportional to the motoring public's travel delays versus the current penalty system when contractors deviate from TWZ schedules,
- Determine whether there is any flexibility for contractors when clearing TWZs as opposed to the strict cut-off times currently in place,

- Benefit-Cost Analysis of utilizing probe vehicle technologies to develop performance measurements versus existing methods of measuring contractor performance regarding potential traffic delays in a roadway construction temporary work zones,

Other minimum deliverables necessary to complete this Research Project include, but are not limited to:

- Presentation of Summary of Literature Search Results
- Discussion to Support and Refine the Project Tasks
- Project work plan.
- Technical Memorandum on the survey results
- Technical memorandum on the measures that are working or not working
- Technical memorandum on actions taken
- Interim Status reports suitable for Senior Leadership if required
- Quarterly Reports and Final report with appropriate tables, graphs and charts in hard copy version, PDF file format, Word, and on CD ROM. Two copies plus one per RSIP member of each presentation, technical memorandum, draft final report, and Final Report (10 copies). The draft Final Report Package, in accordance with the latest version of the “Guidelines for Preparing NJDOT Research Final Reports and Tech Briefs” is due to the customers and Research Project Manager (RPM) four (4) months before the end date of the project contract to allow time for review by the Research Project Selection and Implementation Panel. Final Acceptance will be granted upon receipt of all deliverables including those listed above as well as copies of the approved final report and technical brief.

4. CONTRACT TIME:

Contract time, from Notice to Proceed to acceptance of the Final Report Package, should be no more than **twenty four (24) months maximum**, including the submission of the draft final report package four (4) months prior to the end of contract date.

The Principal Investigator (PI) must provide the anticipated research study duration based on the proposed tasks. Consideration should be given to potential impediments so that adjustments are incorporated into the schedule minimizing the need for time extensions. No-cost time extensions require extraordinary circumstances for approval and should not be considered in negotiating the final project time line.

5. CONTACTS:

Upon request, and subject to staff availability, a meeting may be scheduled with interested parties after the RFP's are distributed to refine the objectives and deliverables and to promote a better understanding of the research needs. Questions on this topic **shall not** be directed to any Research Project Manager, Research Customer, or any other NJDOT person. All questions and answers may be addressed during this meeting (if conducted) or through e-mail. Visit the Bureau of Research website for information about the Bureau of Research. Contact Camille Crichton-Summers before November 14, 2011 (Camille.CrichtonSummers@dot.state.nj.us) with RFP related questions or to express your interest in requesting or participating in a pre-proposal meeting.

6. DEADLINE

<p>Proposals (10 single-bound copies) are due at the NJDOT Bureau of Research No later than 4:00 PM 12/15/2011</p>

Authorization to Begin Work: To be negotiated

7. DELIVERY INSTRUCTIONS:

For private, paid messenger services such as Federal Express, DHL, UPS, etc., or for hand-carried deliveries:

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